

CD NO.

Approved For Release 2002/08/06 : CIA-RDP80-00809A000700210074-2

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	<u>Baden-Wuerttemberg</u>	<u>Federal Republic</u>
Industry	61	69
Transport, occupation powers, public in- stitutions	8	7
Agriculture, commerce, handicrafts, households	18	15
Others	13	9

It should be noted that 75 percent of the power consumption in southern Baden is for industrial purposes, a fact which can be explained by the heavy concentration of chemical industry along the upper Rhine.

The entire consumption of power cannot be met by production in the Land. In 1951, regional power plants produced about 4,550,000,000 kilowatt-hours, while 1,190,000,000 kilowatt-hours came from outside sources. This makes a total of 5,740,000,000 kilowatt-hours, including charging current of 557 million kilowatt-hours. The net consumption is thus 5,182,000,000 kilowatt-hours.

While Baden-Wuerttemberg has no coal, it has considerable quantities of water power available, especially in southern Baden. Thus, the percentage of power generated by hydroelectric plants is high. In 1951, hydroelectric plants in Baden-Wuerttemberg covered 54.5 percent of the power demand of the Land, while the percentage of power from hydroelectric plants for the whole Federal Republic is only 18.2 percent of the total power produced.

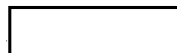
About half of the 1,190,000,000 kilowatt-hours obtained from outside sources came from the hydroelectric power plants of Vorarlberg, Austria, and Switzerland, while the other half was obtained from the steam-electric power plants of the Rhineland and the Ruhr. In times of high water, considerable amounts of current are exported from Baden-Wuerttemberg, while in low-water periods, large quantities are imported. This has led to the organizing of a grid system between the Ruhr and Baden-Wuerttemberg.

The southern border of Baden-Wuerttemberg is formed by Lake Constance and the 140 kilometers of the upper Rhine to the Rhine bend at Basle. This portion of the Rhine is one of Europe's best sources of hydroelectric power. It is distinguished by a very constant volume of water, due to the equalizing effect of the Bodensee and the Swiss lakes. Part of the hydroelectric power generated at the upper Rhine dams goes to Switzerland. Seven of the 12 power plants planned along this stretch of the river have already been completed. Their full capacity is 377,000 kilowatts and their annual average output is 2,600,000,000 kilowatt-hours. After completion of all 12 power plants, the capacity will be 648,000 kilowatts and the average annual output will be 4,200,000,000 kilowatt-hours. A capacity of 287,000 kilowatts, with an average output of 1,900,000,000 kilowatt-hours per year, will be available to Baden. At the present stage of development, 70 percent of this is already being utilized. In addition, Baden-Wuerttemberg has hydroelectric power exploitation on the Neckar River, which is being developed in connection with the construction of the Neckar Canal. After completion of all power plants -- all but three have been completed -- the total capacity of the Neckar power plants will be approximately 80,000 kilowatts, with an annual average output of 462 million kilowatt-hours. Use of these plants has been turned over to various power companies, especially the Rheinisch-Westfaelisches Elektrizitaetswerk. An additional source of hydroelectric power is the Iller River, reaching a capacity of 36,200 kilowatts with an annual average output of 180 million kilowatt-hours. Utilization of this capacity, based on a treaty between Bayern and Wuerttemberg, has been left to Wuerttemberg.

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Furthermore, both Wuerttemberg and Baden have a very large number of small and medium-sized hydroelectric power stations which are either connected to the grid or which supply local industries or power plants. Their total capacity is estimated at 90,000 kilowatts, with an average yearly output of 350-400 million kilowatt-hours. However, the value of these small hydroelectric power plants is greatly reduced by the wide fluctuations in the water volume of the rivers, so that their available output drops to one third of their full capacity just during the period of the highest demand for current.

The fluctuations in water volume of the rivers and the consequent fluctuations in power production led, years ago, to the construction of reservoirs, where the abundant water obtained during the spring and summer is stored for the period of high current consumption during the winter (yearly storage) or where the water not used during the night is stored for use during the day (daily storage). As early as 1914 - 1948, a daily reservoir was added to the Murg power plant in the northern Schwarzwald. It was expanded by the construction of the Schwarzenbach dam, with a yearly reservoir and with pump operations in 1922 - 1926. These two combined plants have a total capacity of 56,000 kilowatts and an average annual output of 115 million kilowatt-hours, plus 20 million kilowatt-hours per year from the pumping operation. The Schluchsee power plant in the southern Schwarzwald is the largest power plant of the Federal Republic with a reservoir. Its first stage at Haeusern started operation in 1931, the second stage at Witzpau in 1943, and the third stage at Waldshut in 1951. The plant utilizes the 620-meter drop between the dammed Schluchsee Lake and the upper Rhine. The total capacity is 450,000 kilowatts and the average yearly output is 289 million kilowatt-hours. Each of the three stages is equipped with storage pumps. They are coupled to the generators, which are operated as motors when the pumps are running. The pumps are used to lift water from the Rhine into the lake through all three power plants. In this manner, the lake can be kept filled all year round. Recovery of current from the pumping operation adds another 330 million kilowatt-hours per year. The Schluchsee installations are operated by the Schluchseewerk AG, which is owned in equal shares by the Badenwerk AG and the Rheinisch-Westfaelisches Elektrizitaetswerk.

An additional possibility for exploiting hydroelectric power through the building of an electric power plant with a reservoir exists in southern Wuerttemberg. The Energie-Versorgung Schwaben AG is planning a plant on the Argen River, utilizing a total drop of 300 meters. With a capacity of about 155,000 kilowatts, the average annual output would be 210 million kilowatt-hours.

Power from the hydroelectric power plants is not nearly adequate to the demand, and will still not be adequate even when all potential hydroelectric power in Baden-Wuerttemberg is being exploited. For that reason, a number of steam-electric power stations have been built. The most important ones are the Marbach plant of the Energie-Versorgung Schwaben AG with a capacity of 212,000 kilowatts and an average annual output of 700 to 800 million kilowatt-hours per year, and the plant of the Grosskraftwerk Mannheim AG. In addition, the Technische Werke der Stadt Stuttgart, the Neckarwerke Elektrizitaetsversorgungs AG at Esslingen, and the municipal power plant of the city of Karlsruhe have a capacity of approximately 300,000 kilowatts. Energie-Versorgung Schwaben AG and Badenwerk AG are planning or have already started construction of steam-electric power stations at Heilbronn and at Rheinhafen near Karlsruhe, respectively. The Stuttgart and Karlsruhe, power plants and the plant of Grosskraftwerk Mannheim AG are to be expanded.

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Baden-Wuerttemberg thus has hydroelectric power stations with a capacity about one billion kilowatts and steam-electric power stations with a capacity of 0.7 billion kilowatts. With 0.32 billion kilowatts obtained from outside sources, a total of about 2 billion kilowatts is available. However, in this calculation, the hydroelectric stations are assumed to be operating at full capacity, at all times, while they are producing only at about half their capacity during the period of highest demand. Furthermore, the steam-electric power stations must have an adequate reserve at their disposal, and, besides, some of the plants belong to interests outside Baden-Wuerttemberg, and export part of their current. Peak loads of 627,000 kilowatts in Wuerttemberg and 642,000 in Baden were established in 1951, which would mean a total peak load of 1,269,000 kilowatts. However, the simultaneous peak load for both regions combined was probably no more than 1,200,000 kilowatts.

It is expected that in the course of the next 8 years, power production, including industrial production for plant consumption, will increase by 60 percent, so that the annual power requirements of Baden-Wuerttemberg will be about 8 billion kilowatt-hours, or 10 percent of the total consumption of the Federal Republic. Investments of 700 to 800 million Deutsche marks (West), on the basis of present prices, will be required for the further expansion of power plants and distribution networks. These sums will have to be raised partly through self-financing and partly through loans and mortgages or other forms of credit.

The fusion of the two Laender, Baden and Wuerttemberg, necessitates an evaluation of their common interests in the field of electric power. The two regional companies, Badenwerk AG and Energie-Versorgung Schwaben AG, have only slight contact. Both have separate systems for obtaining their additional requirements of power from the steam-electric power stations of the Rheinisch-Westfaelisches Elektrizitaetswerk. The Badenwerk AG and the latter are equal partners in the Schluchsee installations, and the Rheinisch-Westfaelisches Elektrizitaetswerk also participates in the exploitation of the water power of the upper Rhine. However, Badenwerk owns no shares in power plants in Wuerttemberg, and, conversely, Energie-Versorgung Schwaben AG holds no interests in Baden. However, the latter is also connected indirectly to the Rheinisch-Westfaelisches Elektrizitaetswerk, as both of them are jointly expanding the Austrian Vorarlberg power plants. Both Badenwerk and Energie-Versorgung Schwaben are engaged in intensive grid operations with the Rheinisch-Westfaelische Elektrizitaetswerk, which has 220,000-volt lines running through Baden-Wuerttemberg to the upper Rhine and to Vorarlberg, but they exchange very small quantities of current with each other.

The political and economic changes brought about by the fusion of the two Laender should result also in closer cooperation between the two companies. Uniform rates, joint exploitation of raw material and power sources, mutual availability of spare current, joint use of grid and transformer installations, elimination of unnecessary competition, joint purchase of raw materials -- especially coal -- and of materials for plant maintenance, and a better credit rating would mean considerable economic advantages which would also benefit the other power-producing enterprises and finally also the consumers.

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